

We would like the editor and reviewers for the second round of feedback. The first and second reviewer did not have further suggestions, but the paper has been revised to incorporate the third reviewer's suggestions as discussed below.

**Referee Comment 1: The contribution of the paper was reconsidered. The paper is better positioned now. The abstract and conclusions reflect the essence of the work much better now. However, some of the phrasing can be still improved to clarify whether a new RF-based dissimilarity measure is proposed or an already known RF-based dissimilarity measure was used for a particular application, i.e. learner segmentation; similarly clarify whether you propose a new rule-based method for interpreting clusters or apply an existing/already known approach for a particular application. From the text in Section 3 it is clear that you rely on existing approaches. However, from the abstract and conclusions a reader may misinterpret your contributions.**

Response: We have modified the abstract and conclusion to make clear this clear. The paper's abstract now reads: "the use of a dissimilarity measure based on the random forest, which handles the stated drawbacks of more traditional clustering approaches, is presented for this task. Additionally, the application of a rule-based method is proposed for interpreting the resulting learner segmentations."

Similarly, the conclusion now reads: "This paper presents the application of a novel clustering approach for the problem of learner segmentation, which is well suited for the learners of online environments (although the approach would certainly be applicable to segmenting learners in other types of environments in which relevant learner attributes are available). The applied approach handles many of the challenges common to educational data, such as high dimensional data with attributes of disparate type and scale, which has not been adequately addressed in the literature. An exhaustive subgroup discovery approach is adopted for uncovering subgroups within each cluster, in turn highlighting key characteristics of each cluster."

**Referee Comment 2: Algorithms 1, 2 and 3 have been added, but they are still not fully formalized in a consistent way. Consider providing algorithms using some pseudocode rather than a mix of natural language and some formalisms. Explanations in the natural language can be used to explain the formal algorithms. Please check all the notations you use. E.g. ( $K=2-6$ ), p. 18 is not the same as for  $K=2, \dots, 6$ .**

Response: The algorithms have been modified to include pseudocode. Notations have been checked for consistency.

**Referee Comment 3: In tables 2 and 3 please put TP and FP into separate columns.**

Response: we have changed this to reflect the reviewer's suggestions.

**Referee Comment 4: It is not obvious why the final learner segmentation analysis framework is put as a separate chapter and why it is called the final. The framework itself was not influenced by the experimental case study; if I got it right, the only way the case study affected the framework as a whole was the choice of parameters. Would it be more logical to place this into Chapter 3, as Section 3.4? And in the case study suggest the choice of parameters?**

Response: the analysis framework is now titled "Learner Segmentation Analysis Framework" and is presented as the final subsection in Section 3 (vs. a separate chapter).

**Referee Comment 5: The complexity of the individual component is not presented in the background section. Please reflect on the computational complexity of your approach and its expected applicability. Now you suggest that the case study is likely not representative as the dataset is not huge. But perhaps efficiency is not of a serious concern if the main intended use of your approach is offline segmentation for conducting controlled experiments with different interventions for different groups.**

Response: The complexity is now presented in the background section (Section 2), as suggested by the reviewer. We note that the proposed approach is not advocated only based on its computational complexity. Rather, our approach is advocated (in the paper) primarily on its effectiveness in accommodating the complexities that occur in educational data (e.g., large number of attributes of disparate types and scales).

**Comment 25 from original review:**

**Original comment: Simple collaborative filtering is described (no pedagogical strategy or other ideas from ITS/AIED)**

**NOTE: authors did not understand this comment originally. The following is the referee's response to this.**

**Referee Response (from second round of reviews): It was referring to the fact that there is no domain expertise integrated into the proposed approach. I.e. it is generic and can be applied for segmenting not just learners but any other objects.**

Response: We have acknowledged the referee's point in the conclusion: "We note that while the approach could be used for segmenting any objects, it is well suited for the learners of online environments."

**Comment 29 from original review:**

**Original comment: Decisions trees => classification, otherwise different level of abstraction with clustering and association analysis.**

**NOTE: authors did not understand this comment originally. The following is the referee's response to this.**

**Referee Response (from second round of reviews): It was referring to the consistent use of keywords at the same level of abstraction, e.g. discussion data mining and clustering is confusing because clustering is one form of data mining. Similarly, decision tree is an instance of classification approach (one concrete approach) while clustering refers to a more general type of approaches, kMeans or anything else being a concrete example of clustering.**

Response: We have presented the background section (Section 2) differently to address this concern. The high level topic of data mining has been removed, and the background now moves more smoothly between discussions of clustering types to a discussion surrounding the selection of appropriate distance measures.